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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/582,392	06/28/2007	Thomas N. Horsky	211843-00044	3848

27160 7590 10/05/2009

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EXAMINER	
SOUW, BERNARD E	

ART UNIT	PAPER NUMBER
2881	

MAIL DATE	DELIVERY MODE
10/05/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/582,392	HORSKY ET AL.	
	Examiner	Art Unit	
	BERNARD E. SOUW	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *9/8/2009 (RCE)*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 70-138* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1 and 70-129* is/are allowed.

6)☒ Claim(s) *130-137* is/are rejected.

7)☒ Claim(s) *138* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *07/07/09 + 09/24/09*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after the Final Rejection dated 03/06/2009. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/08/2009 has been entered.

Reopening of Prosecution After RCE

2. In view of the request for continued examination under 37 CFR 1.114, PROSECUTION IS HEREBY REOPENED. Reason for reopening this prosecution is set forth below.

Terminal Disclaimer

3. The terminal disclaimers filed on 09/08/2009 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S. Patent Application No. 11/452003 and U.S. Patent Application No. 11/647,714 (allowed 6/25/2009 but patent not yet issued) have been reviewed and are accepted. The terminal disclaimers have been recorded.

Information Disclosure Statement

4. Receipt is acknowledged of information disclosure statements (IDS) submitted on 07/07/2009 and 09/24/2009. The submissions are in compliance with the provisions of 37 CFR 1.97.

Signed copies of the information disclosure statements are here enclosed.

Amendment

5. The Amendment filed on 09/08/2009 has been entered. The present Office Action is made with all the suggested amendments being fully considered.

Claims 2-69 have been previously cancelled.

Dependent claims 70 and 103 have been revised to become independent claims with the same numbering.

Dependent claims 131-135 and 137 have been revised to become independent claims with the same numbering.

No new claim has been added.

Claims 1 and 70-138 are pending in this Office Action.

ALLOWANCE

6. Independent Claims 1 and 102 are allowed based on Terminal Disclaimer over U.S. Patent Application No. 11/647,714.

7. New independent claims 70 and 103 are also allowed for incorporating the same limitation that has previously made claims 1 and 102 became allowed.

8. Consequently, claims 71-101 and 104-129 are also allowed for their dependencies, either directly or indirectly, to the previously allowed 1, 70, 102 or 103.

Reasons for Allowance

9. The following is an examiner's statement of reasons for allowance:

Claims 1, 70, 102 and 103 are allowed for reciting an ion beam generating system comprising an ion source in combination with an extraction electrode and a reactive gas cleaning system, the ion source comprising an ionization chamber having an inlet for gaseous or vaporized feed materials and an ionizing system for ionizing the feed material within the ionization chamber, an extraction aperture aligned with an extraction electrode, and a reactive gas cleaning system that is operable when the ionization chamber and ionizing system are ***de-energized*** to remove the deposits from at least some of the surfaces of the ion generating system.

10. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Relevant Prior Art

11. This prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

USPAT 5,466,941 issued to Kim; USPAT 6,670,623 issued to Vella; USPAT 6,391,148 issued to Marks et al.; USPAT 4,697,069 issued to Bleckner; USPGPub 2005/0242293 issued to Benveniste; USPAT 4,450,031 issued to Ono et al.; USPAT 6,033,973 issued to Takemura; and USPAT 7,531,819 issued to diVergilio et al.; all 8 references disclose an ion source system comprising an extraction electrode and a reactive gas cleaning system, the ion source comprising an ionization chamber having an inlet for gaseous or vaporized feed materials and an extraction aperture aligned with an extraction electrode. However, none of the cited prior art references disclose a reactive gas cleaning system that is operable when the ionization chamber and ionizing system are ***de-energized***.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1,148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 130-132 and 134-137 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (USPAT 5,455,941) in view of Benveniste (USPGPub 2005/0242293).

Regarding claim 130, Kim teaches an ion source 14 (or 16) shown in Figs.1 and 2 and an extraction electrode 12 for extracting ions from the ion source, in which the extraction electrode 12 is associated with an electrical heater 18, the heater adapted to maintain the extraction electrode at elevated temperature above the condensation temperature of gaseous or vaporous material leaving the ion source 14 or 16. While Kim's ion extraction electrode 12 is intended to transport a rectangular ion beam to a target 10 to sputter negative ions therefrom rather than to implant ions as recited by the instant claim 130, statements of intended use for the ion beam 25 extracted by the extraction electrode 12 cannot patentably distinguish the extraction electrode. Further, although the temperature of Kim's ion extraction electrode is maintained at an elevated

temperature to vaporize cesium (which has a boiling point of 678.4° C) rather than to counter condensation on the electrode of gases or vapors as recited by the instant claim 130, such a temperature would inherently counter such condensation.

Although Kim fails to teach an ion implantation system, this limitation appears only in the preamble that is not usually accorded any patentable weight. However, in the event Applicant insists, one can, e.g., use Kim's system in Benveniste's ion implantation system, as recited in the Abstract, lines 1-2.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Kim's ion source for Benveniste's ion implantation system, since Kim's ion source can be used with a large variety ion beams useful for semiconductor implantation.

One of ordinary skill in the art would have been motivated to use a diversity of ions to implant dopant ions into semiconductor regions, in order to achieve the type of electric conductivity as desired for a particular application.

► Regarding claims 131 and 132, Benveniste's ion source is capable of implanting aluminum and molybdenum ions, as recited in col.5/ll.16-20.

► Regarding claim 134, Kim's tungsten wire heater 18 is a resistive heater.

► Regarding claim 135, Kim's tungsten wire heater 18 is understood by those knowledgeable in the art to control the electrode temperature to a desired temperature, i.e., to the boiling point of the metal thereby used.

► Regarding claim 136, further in light of claim 135, an electrode temperature between 150 C and 250 C is understood in the art as being appropriate for metals that have boiling point also in the same temperature range.

► Regarding claim 137, Kim's method comprises electrically heating the extraction electrode while extracting ions from the ion source, since otherwise the ions would have a chance to condense on the extraction electrodes.

13. Claim 133 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim in view of Benveniste and in further view of ordinary skill in the art.

Kim as modified by Benveniste shows all the limitations of claim 133, as previously applied to claim 130, except the recitation of the extraction electrode being heated by a radiative heater.

As generally known in the art, Kim's tungsten wire heater 18 can be substituted by a radiative heater that heats the electrode by radiation through empty vacuum.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute Kim's tungsten wire with a radiative heater, in order to have a heating effect in vacuum, i.e., without relying on convection.

One of ordinary skill in the art would have been motivated to perform radiative heating without relying on convection, since such heating remains effective under very low pressures.

Indication of Allowable Subject Matter

14. Claim 138 is objected to as being dependent upon a rejected base claim, but would be allowable upon obviating the present rejection of the respective parent claims, or if rewritten to overcome the rejection(s) and to include all of the limitations of the base claim and any intervening claims.

Reasons for Indication of Allowable Subject Matter

15. The following is an examiner's statement of reasons for allowable subject matter:

Claim 138 contains allowable subject matter for reciting the step of discontinuing the operation and subjecting the extraction electrode surface to cleaning by flow of reactive gas, which is essentially the same as the previously allowed claim 1 regarding combination of an ion extraction electrode with a reactive gas cleaning system that is operable when the ionization chamber and ionizing system are ***de-energized***.

Communications

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard E Souw, whose telephone number is 571 272 2482. The examiner can normally be reached on Monday thru Friday, 9:00 am to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on 571 272 2293. The central fax phone number for the organization where this application or proceeding is assigned is 571 273 8300 for regular communications as well as for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571 272 5993.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Bernard E Souw/ 9/30/2009
Examiner, Art Unit 2881